

**Remarks**

Support the above-requested amendments to claim 27 is found at least on page 2, lines 11-12, page 3, lines 12-17, and claim 34. Claims 35, 38, and 39 have been amended to change the dependencies of the claims. Claims 34 and 50-52 have been canceled without prejudice. Claims 1-26 were canceled in a previous Amendment. New claim 53 is supported at least by page 2, lines 6-12, page 3, lines 3-6 and 12-16, and page 6, lines 19-21. Support for new claim 54 is supported at least by page 3, lines 18-23. New claim 55 is supported at least by page 2, lines 11-12. Support for new claim 56 is found at least on page 4, lines 3-10. New claim 57 is supported at least by page 5, lines 1-3 and page 6, lines 19-20. Support for new claim 58 is found at least on page 4, lines 3-5. New claim 59 is found at least on page 9, lines 10-11. Support for new claim 60 is found at least on page 3, lines 3-5. No question of new matter arises and entry of the amendments and new claims is respectfully requested.

Claims 27-33, 35-49, and 53-60 are before the Examiner for consideration.

**Rejection under 35 U.S.C. §112, second paragraph**

Claims 27-33 and 38-49 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite. In particular, the Examiner asserts that in claim 27, the phrase "a central layer" is unclear because the fabric layer is just an outer, exterior layer and no central layer exists. In addition, the Examiner asserts that claims 38 and 39 were intended to depend from claim 35 and claim 41 was intended to depend from claim 34.

In response, Applicants have amended claim 27 to recite a second reinforcing layer positioned on the continuous strand layer on the side opposing the first reinforcing layer, thereby forming a sandwich structure with the continuous strand layer located between the reinforcing layers. Applicants submit that with this amendment to claim 27, claim 41 properly depends from claim 27. In addition, Applicants have amended claims 38 and 39 to depend from claim 35. Applicants respectfully submit that the claims as amended are sufficiently definite and respectfully request that the Examiner reconsider and withdraw this rejection.

**Rejection under 35 U.S.C. §102(b)**

Claims 27 and 47-49 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,174,228 to Grimnes ("Grimnes"). The Examiner asserts that Grimnes

discloses a layer of randomly distributed glass strands and a layer of glass fabric attached thereto. The Examiner specifically refers to Figure 5.

#### **Applicants' Response**

In response to this rejection, Applicants respectfully direct the Examiner's attention to the amendments made to claim 27 and submit that claim 27 defines a fibrous structure that is not taught (or suggested) within Grimnes. Grimnes teaches a layer of chopped strands that has thereon a confinement layer. (*See, e.g.*, column 1, lines 45-51). The confinement layer may be a weft or non-woven fabric extending across the width of the chopped fibers to maintain the uniform positioning of the chopped fibers. (*See, e.g.*, column 1, lines 37-44). There is, however, no teaching (or suggestion) within Grimnes of a fibrous structure that includes at least one central layer of randomly distributed continuous strands where the continuous strands form loops that are partially superposed one on top of another as claimed in claim 27. Indeed, Grimnes is silent with respect to any teaching or suggestion of loops of continuous fibers.

As is well established, in order for a reference to be anticipatory, each and every element of the claimed invention must be found within the four corners of the cited reference. Applicants respectfully submit that because Grimnes does not teach a central layer of continuous strands in the form of loops partially superposed on each other as required by claim 27, Grimnes is not an anticipatory reference. Accordingly, Applicants submit that independent claim 27, and all claims dependent therefrom, are not anticipated by Grimnes and respectfully request reconsideration and withdrawal of this rejection.

#### **Rejection under 35 U.S.C. §102(b)**

Claims 27-29, 31, 34, and 47-49 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,883,021 to Beer, *et al.* ("Beer"). The Examiner asserts that Beer teaches a central core of randomly distributed glass strands and a layer of glass fabric attached to both sides thereof. The Examiner specifically refers to Figure 8.

#### **Applicants' Response**

In response to this rejection, Applicants respectfully direct the Examiner's attention to the amendments made to claim 27 and submit that claim 27 defines a fibrous structure that is not taught (or suggested) within Beer. Beer teaches a mat that includes a plurality of monofilaments and a plurality of glass fiber strands. (*See, e.g.*, column 2, lines 7-33). In one embodiment, the mat may include one or more fabrics positioned within the mat, adjacent the

top side, and/or adjacent the bottom side of the mat. (*See, e.g.*, column 10, lines 8-12). The fabric can be formed from glass fibers, thermoplastic fibers, and/or thermosetting fibers. (*See, e.g.*, column 10, lines 12-14). In addition, the fabric can be formed as a non-woven or woven material such as a material formed from a slurry of discontinuous or non-continuous fibers. (*See, e.g.*, column 10, lines 14-17). Beer does not, however, teach or suggest a fibrous structure that includes at least one central layer of randomly distributed continuous strands where the continuous strands form loops that are partially superposed one on top of another as claimed in claim 27. Indeed, Beer is silent with respect to any teaching or suggestion of loops of continuous fibers.

As is well established, in order for a reference to be anticipatory, each and every element of the claimed invention must be found within the four corners of the cited reference. Applicants respectfully submit that because Beer does not teach a central layer of continuous strands in the form of loops partially superposed on each other as required by claim 27, Beer is not an anticipatory reference. Accordingly, Applicants submit that independent claim 27, and all claims dependent therefrom, are not anticipated by Beer and respectfully request that this rejection be reconsidered and withdrawn.

**Rejection under 35 U.S.C. §103(a)**

Claims 28-33 and 38-41 have been rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,174,228 to Grimnes ("Grimnes"). The Examiner admits that Grimnes fails to disclose the specific mass per unit area. The Examiner concludes, however, that it would have been obvious to one of skill in the art to make the layer(s) of Grimnes any mass per unit area that is required for a particular application. The Examiner also asserts that one of skill in the art would use whatever length is needed for the particular application and would apply an additional layer in order to form a composite.

**Applicants' Response**

In response to this rejection, Applicants respectfully direct the Examiner's attention to independent claim 27 and submit that claim 27 defines a fibrous structure that is not taught or suggested by Grimnes.

Grimnes teaches a layer of chopped strands that has thereon a confinement layer. (*See, e.g.*, column 1, lines 45-51). The confinement layer may be a weft or non-woven fabric extending across the width of the chopped fibers to maintain the uniform positioning of the chopped fibers. (*See, e.g.*, column 1, lines 37-44). Applicants respectfully submit that there

is no teaching or suggestion within Grimnes of a fibrous structure that includes at least one central layer of randomly distributed continuous strands where the continuous strands form loops that are partially superposed one on top of another as claimed in claim 27. Additionally, it is respectfully submitted that Grimnes does not teach or suggest a first and a second reinforcing layer positioned external to layer of continuous looped strands such that the continuous strand layer is positioned between the first and second reinforcing layers. Indeed, Grimnes is silent with respect to any teaching or suggestion of loops of continuous fibers or of a central layer formed of loops of continuous strands. Accordingly, Applicants respectfully submit that claim 27 is non-obvious and patentable.

In addition, it is respectfully submitted that one of ordinary skill in the art would have no motivation to arrive at a fibrous reinforcing structure that includes (1) at least one central layer of randomly distributed continuous strands, where the continuous strands form loops partially superposed one on top of another, (2) at least one first reinforcing fabric layer disposed exterior to the central layer of randomly distributed continuous strands, and (3) a second reinforcing fabric layer located on another side of the continuous strand layer from the first reinforcing fabric layer, where the layers of the structure are linked together by a mechanical mechanism or a chemical mechanism based on the teachings of Grimnes because Grimnes does not teach or suggest a central layer of randomly distributed continuous strands where the continuous strands form loops that are partially superposed one on top of another or a first and a second reinforcing layer positioned external to layer of continuous looped strands as claimed in claim 27. Without some teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.<sup>1</sup>

Additionally, Applicants submit that because Grimnes does not teach or suggest the claimed central layer of continuous strands where the continuous strands form loops partially superposed one on top of another, Grimnes fails to teach all of the claim limitations set forth in claim 27. Therefore, it is submitted that a *prima facie* case of obviousness has not been established for this additional reason.

In view of the above, it is respectfully submitted that independent claim 27 is not taught or suggested by Grimnes and that claim 27 is therefore non-obvious and patentable.

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<sup>1</sup> In order to establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, and the prior art reference (or references when combined) must teach or suggest all the claim limitations. (See, e.g., *Manual of Patent Examining Procedure*, Patent Publishing,

With respect to dependent claims 28-33 and 38-41, Applicants submit that because independent claim 27 is not taught or suggested by Grimnes and claims 28-33 and 38-41 are dependent upon claim 27 and contain the same elements as claim 27, dependent claims 28-33 and 38-41 are also not taught or suggested by Grimnes.

In light of the above, Applicants submit that claims 28-33 and 38-41 are not obvious over Grimnes and respectfully request reconsideration and withdrawal of this rejection.

**Rejection under 35 U.S.C. §103(a)**

Claims 31-33 and 35-41 have been rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,883,021 to Beer, *et al.* ("Beer"). The Examiner admits that Beer fails to disclose the specific mass per unit area. The Examiner concludes, however, that it would have been obvious to one of skill in the art to make the layer(s) of Beer any mass per unit area that is required for a particular application. The Examiner also asserts that one of skill in the art would use whatever length is needed for the particular application and would apply an additional layer in order to form a composite.

**Applicants' Response**

In response to this rejection, Applicants respectfully direct the Examiner's attention to independent claim 27 and submit that claim 27 defines a fibrous structure that is not taught or suggested by Beer.

Beer teaches a mat that includes a plurality of monofilaments and a plurality of glass fiber strands. (*See, e.g.*, column 2, lines 7-33). In one embodiment, the mat may include one or more fabrics positioned within the mat, adjacent the top side, and/or adjacent the bottom side of the mat. (*See, e.g.*, column 10, lines 8-12). The fabric can be formed from glass fibers, thermoplastic fibers, and/or thermosetting fibers. (*See, e.g.*, column 10, lines 12-14). In addition, the fabric can be formed as a non-woven or woven material such as a material formed from a slurry of discontinuous or non-continuous fibers. (*See, e.g.*, column 10, lines 14-17).

Applicants respectfully submit that there is no teaching or suggestion within Beer of a fibrous structure that includes at least one central layer of randomly distributed continuous strands where the continuous strands form loops that are partially superposed one on top of another as claimed in claim 27. Additionally, it is respectfully submitted that Beer does not

teach or suggest a first and a second reinforcing layer positioned external to layer of continuous looped strands such that the continuous strand layer is positioned between the first and second reinforcing layers. Indeed, Beer is silent with respect to any teaching or suggestion of loops of continuous fibers or of a central layer of loops of continuous strands. Accordingly, Applicants respectfully submit that claim 27 is non-obvious and patentable.

In addition, it is respectfully submitted that one of ordinary skill in the art would have no motivation to arrive at a fibrous reinforcing structure that includes (1) at least one central layer of randomly distributed continuous strands, where the continuous strands form loops partially superposed one on top of another, (2) at least one first reinforcing fabric layer disposed exterior to the central layer of randomly distributed continuous strands, and (3) a second reinforcing fabric layer located on another side of the continuous strand layer from the first reinforcing fabric layer, where the layers of the structure are linked together by a mechanical mechanism or a chemical mechanism based on the teachings of Beer because Beer does not teach or suggest a central layer of randomly distributed continuous strands where the continuous strands form loops that are partially superposed one on top of another or a first and a second reinforcing layer positioned external to layer formed of continuous looped strands. Without some teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.<sup>2</sup>

Additionally, Beer does not teach or suggest the claimed central layer of looped continuous strands, Applicants respectfully submit that Beer fails to teach all of the claim limitations set forth in claim 27. Therefore, it is submitted that a *prima facie* case of obviousness has not been established for this additional reason.

In view of the above, it is respectfully submitted that independent claim 27 is not taught or suggested by Beer and that claim 27 is therefore non-obvious and patentable. With respect to dependent claims 31-33 and 35-41, Applicants submit that because independent claim 27 is not taught or suggested by Beer and claims 31-33 and 35-41 are dependent upon claim 27 and contain the same elements as claim 27, dependent claims 31-33 and 35-41 are also not taught or suggested by Beer.

In light of the above, Applicants submit that claims 31-33 and 35-41 are not obvious over Beer and respectfully request reconsideration and withdrawal of this rejection.

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<sup>2</sup> *Id.*

**Rejection under 35 U.S.C. §103(a)**

Claims 42-46 have been rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,174,228 to Grimnes ("Grimnes") or U.S. Patent No. 5,883,021 to Beer, *et al.* ("Beer") as applied to claim 27 above, in view of U.S. Patent No. 3,197,860 to Gracer ("Gracer") or U.S. Patent No. 4,298,647 to Cancio, *et al.* ("Cancio"). The Examiner admits that Grimnes and Beer fail to teach the inclusion of notches to aid in bending the composite.

In this regard, the Examiner asserts that both Gracer and Cancio disclose that it is known in the art to form notches in a material in order to aid in bending the material. The Examiner concludes that it would have been obvious to one of skill in the art to include notches in the materials of Grimnes and Beer to aid in bending.

**Applicants' Response**

In response to this rejection, Applicants respectfully direct the Examiner's attention to independent claim 27 and submit that claim 27 defines a high strength glass fiber that is neither taught nor suggested by Grimnes, Beer, Gracer, or Cancio. In addition, Applicants submit that Grimnes, Beer, Gracer, and Cancio fail to teach the combination of features recited in claim 27.

Applicants respectfully submit that neither Grimnes nor Beer teaches or suggests the fibrous structure claimed in claim 27. In particular, Applicants respectfully submit that there is no teaching or suggestion within Grimnes or Beer of a fibrous structure that includes at least one central layer of randomly distributed continuous strands where the continuous strands form loops that are partially superposed one on top of another as claimed in claim 27. Additionally, it is respectfully submitted that Grimnes and Beer do not teach or suggest a first and a second reinforcing layer positioned external to a layer of continuous looped strands such that the continuous strand layer is positioned between the first and second reinforcing layers. Indeed, Grimnes and Beer are silent with respect to any teaching or suggestion of loops of continuous strands or of a central layer formed of loops of continuous strands. Gracer and Cancio do not teach or suggest loops of continuous strands, and as such, cannot make up for the deficiencies of Grimnes or Beer. Therefore, it is respectfully submitted that the combination of Grimnes, Beer, Gracer, and Cancio would not result in the fibrous structure of claim 27. Accordingly, it is respectfully submitted that claim 27 is non-obvious and patentable.

In addition, it is respectfully submitted that one of ordinary skill in the art would have no motivation to arrive at a fibrous reinforcing structure that includes (1) at least one central

layer of randomly distributed continuous strands, where the continuous strands form loops partially superposed one on top of another, (2) at least one first reinforcing fabric layer disposed exterior to the central layer of randomly distributed continuous strands, and (3) a second reinforcing fabric layer located on another side of the continuous strand layer from the first reinforcing fabric layer, where the layers of the structure are linked together by a mechanical mechanism or a chemical mechanism based on the teachings of Grimnes, Beer, Gracer, and/or Cancio because none of Grimnes, Beer, Gracer, or Cancio teaches or suggests a central layer of randomly distributed continuous strands where the continuous strands form loops that are partially superposed one on top of another or a first and a second reinforcing layer positioned external to a central layer of continuous looped strands. Without some teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.<sup>3</sup>

Additionally, because none of Grimnes, Beer, Gracer, or Cancio teaches or suggests the claimed central layer of continuous strands where the continuous strands form loops partially superposed one on top of another, Applicants respectfully submit that Grimnes, Beer, Gracer, and Cancio, in any combination, fail to teach all of the claim limitations set forth in claim 27. Therefore, it is submitted that a *prima facie* case of obviousness has not been established for this additional reason.

In view of the above, it is respectfully submitted that independent claim 27 is not taught or suggested by Grimnes, Beer, Gracer, and Cancio and that claim 27 is therefore non-obvious and patentable. With respect to dependent claims 42-46, Applicants submit that because independent claim 27 is not taught or suggested by Grimnes, Beer, Gracer, and Cancio and claims 42-46 are dependent upon claim 27 and contain the same elements as claim 27, dependent claims 42-46 are also not taught or suggested by Grimnes, Beer, Gracer, and/or Cancio.

In light of the above, Applicants submit that claims 42-46 are not obvious over Grimnes or Beer in view of Gracer or Cancio and respectfully request reconsideration and withdrawal of this rejection.

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<sup>3</sup> *Id.*



**Conclusion**

In light of the above, Applicants believe that this application is now in condition for allowance and therefore request favorable consideration.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

If necessary, the Commissioner is hereby authorized to charge payment or credit any overpayment to Deposit Account No. 50-0568 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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